REMARKS/ARGUMENTS

This paper is being provided in response to the December 27, 2010 Final Office Action for the above-referenced application. In this response, Applicant has canceled Claims 2, 5-9, 11, 14-18, 20, 23-27, added new Claims 28-31, and amended Claims 1, 10 and 19 in order to clarify that which Applicant deems to be the claimed invention. Applicant respectfully submits that the amendments to the claims and the newly added claims are all supported by the originally filed application.

The rejection of Claims 1, 3, 4, 10, 12, 13, 19, 21 and 22 under 35 U.S.C. 112, second paragraph, as being indefinite is hereby traversed and reconsideration thereof is respectfully requested.

Applicant has clarified Claims 1 and 10 herein to remove language regarding a portion of entities so that Claims 1 and 10 now recite that the reference retention times are assigned to all entities in the first injection and the second injection. As such, it is respectfully submitted that Claims 1 and 10, and claims depending therefrom, are now clear and not indefinite.

Regarding Claim 19, Applicant has amended Claim 19 to recite that the reference retention times are assigned to all entities in the first injection and the second injection. As such, it is respectfully submitted that Claim 19, and claims depending therefrom, are now clear and not indefinite.

It is respectfully submitted that, based on the foregoing, Claims 1, 3, 4, 10, 12, 13, 19, 21 and 22 are not indefinite and clearly set forth that which Applicant regards as the claimed invention. Accordingly, Applicant respectfully requests that the rejection be reconsidered and withdrawn.

The rejection of Claims 1, 3, and 4 under 35 U.S.C. 101 as being directed to non-statutory subject matter is hereby traversed and reconsideration thereof is respectfully requested.

Claim 1 has been amended herein to explicitly recite that a computer is used with the steps of comparing, identifying and constructing. Therefore, it is respectfully submitted that Claim 1 is tied to a particular machine, a computer. Thus, it is respectfully submitted that Claim 1, and claims that depend therefrom, are not directed to laws of nature, physical phenomena, or merely abstract ideas and are directed to patentable subject matter in accordance with 35 U.S.C. 101.

In view of the foregoing, Applicant respectfully requests that the rejection be reconsidered and withdrawn.

The rejection of Claims 1, 3, 4, 10, 12, 13, 19, 21 and 22 under 35 U.S.C. 102(b) and (e) as being anticipated by Higgs (US Patent No. 5,885,841, hereinafter "Higgs") is hereby traversed and reconsideration thereof is respectfully requested.

Claim 1, as amended herein, recites a method for tracking entities in an LC/MS system, comprising: choosing a subset of entities from a first injection; choosing a subset of entities from a second injection; comparing, using a computer, the entities chosen from the first injection to those chosen from the second injection; identifying, using a computer, entities chosen from the first injection that match entities chosen from the second injection; constructing, using a computer, a retention time map based on the matching entities of the subsets, said constructing including determining a filtered retention time drift for each pair of matching entities including a first entity from the first injection and a second matching entity from the second injection; assigning, based on the retention time map, reference retention times to all entities in the first injection and the second injection, wherein reference retention times are assigned to entities in the second injection using the filtered retention time drifts determined in said constructing; and tracking entities through the first and second injections using the reference retention times and mass values. Claims 3 and 4 depend from Claim 1.

Claim 10, as amended herein, recites a system for tracking entities in an LC/MS system, the system comprising a computer programmed to perform processing, said processing comprising: choosing a subset of entities from a first injection; choosing a subset of entities from

a second injection; comparing the entities chosen from the first injection to those chosen from the second injection; identifying entities chosen from the first injection that match entities chosen from the second injection; constructing a retention time map based on the matching entities of the subsets, said constructing including determining a filtered retention time drift for each pair of matching entities including a first entity from the first injection and a second entity from the second injection; assigning, based on the retention time map, reference retention times to all entities in the first injection and the second injection, wherein reference retention times are assigned to entities in the second injection using the filtered retention time drifts determined in said constructing; and tracking entities through the first and second injections using the retention time map and mass values. Claims 12 and 13 depend from Claim 10.

Claim 19, as amended herein, recites a system for tracking entities in an LC/MS system, comprising: a liquid chromatograph into which the sample is injected to separate entities in the sample, and to determine a retention time associated with each of the one or more entities; a mass spectrometer into which the entities are input to determine a mass of each of the one or more entities; and a computer programmed for: choosing, based on intensity, a subset of entities from a first injection and a subset of entities from a second injection; comparing the entities chosen from the first and second injections; identifying matching entities in the first and second injections; constructing a retention time map based on the matching entities, said constructing including determining a filtered retention time drift for each pair of matching entities including a first entity from the first injection and a second entity from the second injection; assigning reference retention times to all entities in the first injection and the second injection based on the retention time map, wherein reference retention times are assigned to entities in the second injection using the filtered retention time drifts determined in said constructing; and tracking the entities using the retention time map and mass values. Claims 21 and 22 depend from Claim 19.

Higgs discloses a system for analyzing a protein sample, comprising a reactor vessel, a chromatographic column, a mass spectrometer, and a computer system. The reactor vessel comprises an enzyme activity capable of digesting the protein sample in order to provide a plurality of peptide digests, an inlet port for receiving the protein to be digested, and an exit port for discharging the peptide digests. The chromatographic column comprises a chromatographic

medium capable of chromatographically fractionating the peptide digests as the peptide digests are eluted through the column, wherein the chromatographic column comprises an inlet port for receiving the peptide digests, said inlet port being in flow communication with the exit port of the reactor vessel, and wherein the chromatographic column comprises an exit port for discharging an effluent comprising the chromatographically fractionated peptide digests. The mass spectrometer is capable of generating a mass spectroscopic data set comprising data from which a first plurality of selective ion chromatograms for the fractionated peptide digests can be generated. The mass spectrometer has an inlet port for receiving the chromatographically fractionated peptide digests. The inlet port is in flow communication with the exit port of the chromatographic column. The computer system is operationally coupled to the mass spectrometer such that the computer system is capable of analyzing the mass spectroscopic data set. The computer system comprises programming enabling the computer system to analyze protein samples using selective ion chromatograms derived from the mass spectroscopic data set. (See Abstract).

As noted above, Claim 1, as amended herein, recites a method for tracking entities in an LC/MS system. A subset of entities from a first injection is chosen. A subset of entities from a second injection is chosen. Using a computer, the entities chosen from the first injection are compared to those chosen from the second injection. Using a computer, entities chosen from the first injection that match entities chosen from the second injection are identified. Using a computer, a retention time map is constructed based on the matching entities of the subsets. The step of constructing includes determining a filtered retention time drift for each pair of matching entities including a first entity from the first injection and a second matching entity from the second injection. Based on the retention time map, reference retention times are assigned to all entities in the first injection and the second injection. Reference retention times are assigned to entities in the second injection using the filtered retention time drifts determined in said constructing. Entities are tracked through the first and second injections using the reference retention times and mass values.

For reasons set forth below, it is respectfully submitted that Higgs does not disclose or fairly suggest amended Claim 1. In particular, it is respectfully submitted that Higgs does not

disclose or suggest at least the above-noted features in connection with the constructing and assigning steps of amended Claim 1. That is, Higgs does not disclose or fairly suggest constructing a retention time map where the constructing includes determining a filtered retention time drift for each pair of matching entities including a first entity from the first injection and a second matching entity from the second injection, as set forth in Claim 1. Furthermore, Higgs does not disclose or suggest assigning reference retention times to all entities in the first and second injections where reference retention times are assigned to entities in the second injection using the filtered retention time drifts determined in said constructing, as set forth in Claim 1.

With respect to Claim 1, as noted in Applicant's previously submitted response, the Office Action cites to Higgs' disclosure of locating and matching chromatographic peaks as support for disclosing the recited comparing and identifying steps of Claim 1, cites to Higgs' disclosure of identifying retention time intervals for the peaks as support for disclosing the recited constructing step of Claim 1, and additionally cites to Higgs' disclosure of aligning retention times as support for disclosing the recited assigning step of Claim 1. Claim 1 recites that constructing the retention time map based on the matching entities in the subsets includes determining a filtered retention time drift for each pair of matching entities including a first entity from the first injection and a second matching entity from the second injection. Claim 1 further recites using the filtered retention time drifts in the assigning step to assign reference retention times to entities in the second injection. Higgs discloses comparing first and second mass spectroscopic data sets to align the retention time of one sample relative to the other sample. Higgs discloses that it is preferred to align off of standard mixtures that are analyzed prior to the analysis of each sample. Use of such standards assumes that the column changes between analysis of a standard and subsequent analysis of the corresponding sample are negligible. To accomplish alignment, the standards and samples are subjected to mass spectroscopic analysis and then total ion chromatograms for a standard example are computed from the resultant data. Given the total ion chromatograms (TIC's) for each standard mixture associated with each sample, a dynamic time warping algorithm is used to align one standard mixture relative to the other standard mixture. (See Col. 20, beginning at line 15 of Higgs). Higgs discloses performing post processing of selective ion chromatograms for baseline removal

and noise filtering. (See Col. 17, beginning at line 42 of Higgs). However, Higgs appears silent regarding a filtered retention time drift and its use, as set forth in Claim 1. Higgs does not disclose constructing a retention time map that includes determining a filtered retention time drift for each pair of matching entities, as set forth in Claim 1. Higgs, such as through Higgs' disclosure of performing alignment as noted above or elsewhere, also does not disclose or suggest an assigning step, as set forth in Claim 1, which assigns reference retention times to all entities and wherein entities in the second injection are assigned reference retention times using the filtered retention time drifts determined in the recited constructing step which constructs a retention time map.
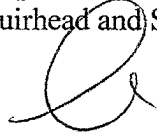
For at least the foregoing reasons, it is respectfully submitted that Higgs does not disclose or fairly suggest Claim 1, and claims that depend therefrom. Independent Claims 10 and 19 recite features similar to those of Claim 1 which, as pointed out above, are neither disclosed nor suggested by Higgs. Thus, it is respectfully submitted that Claims 10 and 19, and claims that depend therefrom, are also neither disclosed nor suggested by Higgs for reasons similar to those set forth above regarding Claim 1.

In view of the foregoing, Applicant respectfully requests that the rejection be reconsidered and withdrawn.

Newly added Claims 28-31 depend from Claim 1. It is respectfully submitted that newly added Claims 28-31 are neither disclosed nor suggested by the cited reference for at least the reasons Claim 1 is not disclosed or suggested by the cited reference.

Based on the above, Applicant respectfully requests that the Examiner reconsider and withdraw all outstanding rejections and objections. Favorable consideration and allowance are earnestly solicited.

Respectfully submitted,
Muirhead and Saturnelli, LLC

Anne E. Saturnelli
Reg. No. 41,290

Muirhead and Saturnelli, LLC
200 Friberg Parkway, Suite 1001
Westborough, MA 01581
Tel: (508) 898-8601
Fax: (508) 898-8602

Date: June 10, 2011